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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

VU, QUANG D

ART UNIT

PAPER NUMBER

2811

DATE MAILED: 01/02/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/893,036

Applicant(s)

SATHE, AJIT V.

Examiner

Quang D Vu

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on admmendment filed on 10/08/2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 17-19,21-23,26-28,31-33 and 35-46 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 37-40 is/are allowed.
- 6) ☒ Claim(s) 17-19,21-23,26-28,31-33,41 and 42 is/are rejected.
- 7) ☒ Claim(s) 35,36 and 43-46 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 17-19 are rejected under 35 U.S.C. 102(b) as being anticipated by US Patent No. 5,598,033 to Behlen et al.

Regarding claim 17, Behlen et al. (figures 3-6) teach an electronic package substrate comprising:

a thin, flexible, electrically insulating film (338 in Layer 1, Layer 2, Layer 3, and Layer 4) having a conductor region (a conductor region is within the Layer 1, Layer 2, Layer 3, Layer 4) to mount an integrated circuit (310-4);

a plurality of traces (T1, T2, T3, T4) within the film, including within the conductor region (a conductor region is within the Layer 1, Layer 2, Layer 3, Layer 4); and

a plurality of lands (326a-4, 326b-4, 326c-4, 326d-4) on a surface of the film (338 in Layer 4) and coupled to the traces (T1, T2, T3, T4), wherein the lands are to mount corresponding pads of the integrated circuit (310-4) in a ball grid array (314a-4 to 314e-4) (see figure 6; column 5, line 47 – column 6, line 21).

Regarding claim 18, Behlen et al. teach the film is formed of material comprising a polyimide (column 4, lines 38 – 40).

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Regarding claim 19, Behlen et al. teach the film comprises a plurality of layers (338 in Layer 1, Layer 2, Layer 3, and Layer 4), each comprising a plurality of traces (T1, T2, T3, T4) (see figure 6; column 5, lines 4 – 19).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 21-23 and 41-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent No. 5,818,699 to Fukuoka.

Regarding claim 21, Fukuoka (figure 3) teaches an electronic package comprising: an electrically insulating film (101, 151) having a conductor region (a conductor region is in the layer [101]), a plurality of traces (104) in the conductor region, and a plurality of lands (105) coupled to the traces (104); and an integrated circuit (102) having a plurality of pads (106) coupled to the plurality of lands (105) in a ball grid array (107).

Behlen et al. differ from the claimed invention by not showing an electrically insulating film having a thickness in the range of approximately 0.15 to 0.90 millimeters. It would have been obvious to one having ordinary skill in the art at the time the invention was made for an electrically insulating film having a thickness in the range of approximately 0.15 to 0.90 millimeters, since it has been held that where the general conditions of a claim are disclosed in

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the prior art, discovering the optimum or workable ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

Regarding claim 22, Fukuoka teaches the film (151) is formed of material comprising a polyimide (column 15, lines 42-44).

Regarding claim 23, Fukuoka teaches the film (101) comprises a plurality of layers, each comprising a plurality of traces (104) in the conductor region (a conductor region is in the layer [101]). Fukuoka does not teach each layer has a thickness within the range of approximately 0.15 to 0.30 millimeters. It would have been obvious to one having ordinary skill in the art at the time the invention was made for each layer has a thickness within the range of approximately 0.15 to 0.30 millimeters, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

Regarding claim 41, Fukuoka teaches the film (101) comprises one or more vias coupled to corresponding ones of the traces (104) (see figure 3).

Regarding claim 42, Fukuoka teaches the film (101) comprises one or more vias to couple traces (104) within different layers.

5. Claims 26-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent No. 5,598,033 to Behlen et al.

Regarding claim 26, Behlen et al. teach an electronic system having at least one electronic assembly comprising a thin, flexible, electrically insulating film (338 in Layer 1, Layer 2, Layer 3, and Layer 4) having a conductor region (a conductor region is within the Layer 1, Layer 2,

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Layer 3, Layer 4), a plurality of traces (T1, T2, T3, T4) in the conductor region, and a plurality of lands (326a-4, 326b-4, 326c-4, 326d-4) coupled to the traces.

Behlen et al. differ from the claimed invention by not showing an integrated circuit having a plurality of pads coupled to the plurality of lands in a ball grid array. It would have been obvious to one having ordinary skill in the art at the time the invention was made for an integrated circuit having a plurality of pads coupled to the plurality of lands in a ball grid array since it is desirable to provide interconnection points.

Regarding claim 27, Behlen et al. teach the film is formed of material comprising a polyimide (column 4, lines 38 – 40).

Regarding claim 28, Behlen et al. teach the film comprises a plurality of layers (338 in Layer 1, Layer 2, Layer 3, and Layer 4), each comprising a plurality of traces (T1, T2, T3, T4) in the conductor region (a conductor region is within the Layer 1, Layer 2, Layer 3, Layer 4).

4. Claims 31-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent No. 5,818,699 to Fukuoka in view of US Patent No. 5,832,294 to Reinschmidt.

Regarding claim 31, Fukuoka teaches a thin, flexible electrically insulating film (151) having a conductor region, a plurality of traces (104) in the conductor region (a conductor region is in the layer [101]), and a plurality of lands (105) coupled to the traces; and an integrated circuit (102) having a plurality of pads (106) coupled to the plurality of lands (105).

Fukuoka differs from the claimed invention by not showing a bus coupling components in the data processing system; a display coupled to the bus; a memory coupled to the bus; and a processor coupled to the bus. However, Reinschmidt teaches microprocessor, CPU, bus and

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memory (see figures 4a and 4b; column 2, lines 45 – 48; column 4, line 47 – column 5, line 3). It would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the teaching of Reinschmidt into the device taught by Fukuoka, since it is desirable to add functionality to the device.

Regarding claim 32, Fukuoka teaches the film (151) is formed of material comprising a polyimide (column 15, lines 42-44).

Regarding claim 33, Fukuoka teaches the film (151) comprises a plurality of layers, each comprising a plurality of traces (104) in the conductor region (a conductor region is in the layer [151]).

Allowable Subject Matter

5. Claims 35-36, 43-44, 45-46 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

6. Claims 37-40 are allowed.

7. The following is an examiner's statement of reasons for allowance: The most closely related art, US Patent No. 5,818,699 to Fukuoka. Fukuoka does not anticipate or render the claimed invention such as one or more via within the film and coupled to corresponding ones of the traces.

Response to Arguments

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Applicant's arguments filed 10/08/02 have been fully considered but they are not persuasive.

It is argued, in page 11 of the remarks, that Behlen et al. do not teach or suggest a plurality of traces within the film, including within the conductor region. This argument is not convincing because Behlen et al. teach a plurality of traces (T1, T2, T3, T4) within the film (338 in layer 1, layer 2, layer 3, and layer 4), including within the conductor region (the conductor region is in each of layer 1, layer 2, layer 3 and layer 4).

It is argued, in page 11 of the remarks, that Behlen et al. do not teach or suggest a plurality of lands on a surface of the film and coupled to the traces, wherein the lands are to mount corresponding pads of the integrated circuit in a ball grid array. This argument is not convincing because Behlen et al. teach a plurality of lands (326a-4, 326b-4, 326c-4, 326d-4) on a surface of the film (318 in Layer 4) and coupled to the traces (T1, T2, T3, T4), wherein the lands (326a-4, 326b-4, 326c-4, 326d-4) are to mount corresponding pads of the integrated circuit (310-4) in a ball grid array (314a-4 to 314e-4).

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after

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the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Quang D Vu whose telephone number is 703-305-3826. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on 703-308-2772. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

qv
December 30, 2002

Steven Loh